

REMARKS

The following remarks are submitted to address the issues raised in the Office Action mailed October 5, 2004.

Claims 1-53 are currently pending in the application, claims 52 and 53 having been added by the foregoing amendment. Claims 1-4, 8-12, 15, 23-26, 30-34, 45, and 47 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,259,190 to Fahey (hereinafter "Fahey").¹ Claims 13-14, 16-22, 35-36, 38-44, and 47-51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fahey as applied to claims 1-4, 8-12, 15, 23-26, 30-34, 45, and 47.

Claims 5-7 and 27-29 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Applicant has amended claim 48 to correct dependency. Claim 48, as originally filed, inadvertently depended from claim 22. Applicant has corrected this error by amending claim 48, such that claim 48 now depends from claim 23.

Applicant has added new claims 52 and 53.

Applicant respectfully requests consideration of the application in view of the foregoing amendments and the following remarks.

¹ The Detailed Action, on page 2, states that claim 28 is rejected under 35 U.S.C. 102(b) based on Fahey. However, the Detailed Action later indicates that claim 28 would be allowable if rewritten in independent form. *See* Office Action, mailed October 5, 2004, p. 4. As claim 28 depends from claim 27, which the Office Action states is allowable, Applicant presumes that claim 28 was inadvertently listed among the claims rejected under 35 U.S.C. 102(b).

Claims 1-4, 8-12, 15, 23-26, 30-34, 45, and 47 – 35 U.S.C. 102(b)

The rejection of claims 1-4, 8-12, 15, 23-26, 30-34, 45, and 47 under 35 U.S.C. 102(b) as being anticipated by Fahey is respectfully traversed.

Fahey relates to sizing compositions and sized glass fibers produced therefrom that have a reduced tendency to form gumming deposits.

Independent claim 1 recites an aqueous sizing composition for glass fibers that comprises a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch. Independent claim 23 recites a glass fiber at least partially coated with the residue of a sizing composition comprising a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch.

The Office Action asserted that claims 1-4 and 23-26 are product by process claims and continued: “Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.”² In applying these principles, the Office Action failed to consider the limitation in claims 1 and 23 that the starch mixture is “cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch.”

² Office Action, mailed October 5, 2004, p. 2 (citation omitted).

Applicant respectfully traverses the Office Action's failure to consider this limitation in assessing the patentability of claims 1 and 23. As discussed below, Applicant respectfully submits that the limitation "cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch" defines structure associated with the starch mixture. Further, Applicant respectfully submits that Fahey does not teach or suggest an aqueous sizing composition for glass fibers or a glass fiber at least partially coated with the residue of a sizing composition, wherein the sizing composition comprises a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch. The sizing compositions of Fahey include a starch mixture that incorporates a high amylose starch component and an easily cookable low amylose starch component. To the extent that Fahey discusses cooking of its starch mixture, Fahey only notes that the total starch mixture is partially cooked only to around 10 to around 30 percent by weight of the starch in the total starch mixture. Fahey states:

The starch mixture that has been cooked either by cooking the individual components and adding them together or adding the starch components together then cooking the mixture yields a mixture that contains partially cooked starch because of the fact that one starch component is easily cookable while the other starch component is difficult to cook. The partially cooked starch is predominantly the easily cooked starch, i.e., the low amylose starch component, but some starch from the high amylose starch component may also be cooked. Overall, the partial cooking of the total starch mixture is around 10 to around 30 percent by weight of the starch in the starch mixture.³

Based on the foregoing, Applicant respectfully submits that Fahey does not teach or suggest a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a

³ Fahey, col. 4, l. 60 to col. 5, l. 4.

temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch.

Applicant respectfully submits that the limitation “cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch” defines structure associated with the starch mixture recited in claims 1 and 23. According to Applicant’s specification: “When starch granules are cooked in water, two main events occur: the starch granules swell and materials inside the granule, such as amylose, leach out. By cooking the starch mixture at a cooking temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch, a majority of the starch granules in the starch mixture swell and rupture. Because a majority of the starch granules rupture, upon cooling the cooked starch mixture does not significantly increase in viscosity”⁴ Applicant respectfully submits that the cooking of the starch mixture to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch imparts distinctive structural characteristics to the starch mixture. Applicant further respectfully submits that the structural characteristics of a cooked starch mixture with at least 50% of the high viscosity starch solubilized and at least 50% of the low viscosity starch solubilized are difficult to otherwise define. According to section 2113 of the MPEP: “The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart

⁴ Specification, ¶ [0027].

distinctive structural characteristics to the final product.”⁵ Accordingly, Applicant respectfully submits that the Office Action should have considered that the starch mixture was “cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch[.]”

For at least the reason that Fahey fails to teach or suggest an aqueous sizing composition that comprises a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch as recited in claim 1, Applicant respectfully submits that claim 1 is patentable. As claims 2-4, 8-12, 15, and 47 depend from claim 1 or an intervening dependent claim, Applicant respectfully submits that these claims are likewise patentable.

For at least the reason that Fahey fails to teach or suggest a glass fiber at least partially coated with the residue of a sizing composition comprising a starch mixture comprising a high viscosity starch and a low viscosity starch cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch as recited in claim 23, Applicant respectfully submits that claim 23 is patentable. As claims 24-26, 28, 30-34, and 45 depend from claim 23 or an intervening dependent claim, Applicant respectfully submits that these claims are likewise patentable.

Claims 13-14, 16-22, 35-36, 38-44, and 47-51 – 35 U.S.C. 103(a)

The rejection of claims 13-14, 16-22, 35-36, 38-44, and 47-51 under 35 U.S.C. 35 U.S.C. 103(a) as being unpatentable over Fahey is respectfully traversed.

⁵ MPEP § 2113 (citing *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)).

Claims 13-14, 16-22, and 47 depend from claim 1 or an intervening dependent claim. Applicant has previously set forth why claim 1 is patentable over Fahey. As claims 13-14, 16-22, and 47 each depend from claim 1 or an intervening dependent claim, Applicant likewise respectfully submits that these claims are patentable.

Claims 35-36, 38-44, and 48-51 depend from claim 23 or an intervening dependent claim. Applicant has previously set forth why claim 23 is patentable over Fahey. As claims 13-14, 16-22, and 48-51 each depend from claim 23 or an intervening dependent claim, Applicant likewise respectfully submits that these claims are patentable.

New Claims

Applicants have added new claims 52 and 53. Support for these claims can be found in the claims as originally filed.

New claim 52 recites an aqueous sizing composition for glass fibers that comprises a starch mixture comprising: a high viscosity starch comprising an unmodified starch having an amylose content of > 50%, and a low viscosity starch comprising a modified starch comprising > 50% amylose.

New claim 53 recites a glass fiber at least partially coated with the residue of a sizing composition that comprises a starch mixture comprising: a high viscosity starch comprising an unmodified starch having an amylose content of > 50%, and a low viscosity starch comprising a modified starch comprising > 50% amylose.

New claims 52 and 53 are based on claims 5 and 27, respectively, which the Office Action indicated contained allowable subject matter. In considering the independent claims from which claims 5 and 27 depend (claims 1 and 23), the Office Action did not consider the

language that the starch mixture was “cooked at a temperature sufficient to solubilize at least 50% of the high viscosity starch and to solubilize at least 50% of the low viscosity starch” to be a limitation. New claims 52 and 53 do not include this limitation, but Applicant respectfully submits that these claims are in condition for allowance given the Office Action’s previous treatment of claims 5 and 27.

CONCLUSION

For the foregoing reasons, a favorable Office Action is respectfully solicited. The Examiner is respectfully invited to contact J. Jason Link at 336.607.7443 or Charles W. Calkins at 336.607.7315 to discuss any matter relating to this application.

Respectfully submitted,

Date:

February 3, 2005



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